



13-1-8

PROTECTION OF CULTURAL INHERITANCE FROM URBAN DISASTER

Yujiro OGAWA¹

¹ Urban Safety Research Institute, Tokyo, Japan

SUMMARY

This report describes a study on the protection of cultural inheritance from urban disasters. The author reviews state of the art in disaster protection of cultural inheritance and proposing the concept for protecting cultural inheritance from disasters in view of detecting potential of disaster occurrence and vulnerability of the cultural inheritance for disaster.

INTRODUCTION

Cultural inheritance is defined to mean materials collected and preserved in museums, libraries and archives. The urban disaster includes earthquake, flood, fire and etc. which are aggravated or amplified by the characteristics of urban areas. The reason why urban disasters are important with a view to preserving cultural inheritance should be described. The personnel employed in the cultural inheritance preservation facilities are not experts for disaster protection. On the other hand, the experts of disaster prevention rather focus on macroscopic disaster prevention such as damage estimation or damage potential in local area. Therefore disaster prevention in individual facilities such as cultural inheritance facilities has been remained.

Earthquake or flood may not attack very frequently. Such a disaster occurs as seldom as only once or none in the life time. The matter of preserving cultural inheritance ranges a time period incomparably longer than human life. Accordingly, the probability of encountering disaster becomes much longer. Consequently, earthquake, flood or etc. may possibly occur during the preservation period of cultural inheritance.

CULTURAL INHERITANCE PRESERVATION FACILITIES

Major facilities for preserving cultural inheritance include

museums, libraries and archives. The geographical distribution of these facilities is shown Table 1. Tokyo retains the second most museums, next to Hokkaido. The largest number of Art Museums and Historical Museums are constructed in Tokyo. There are overwhelmingly the largest number of libraries and archives are located in Tokyo.

Table 1 Distribution of Cultural Inheritance Facilities

MUSEUMS	TOKYO 166	HOKKAIDO 173	NAGANO 123	GIFU 122	TOTAL 2356
LIBRARIES	TOKYO 291	CHIBA 89	SAITAMA 76	OOSAKA 72	TOTAL 1643
ARCHIVES	TOKYO 3				TOTAL 22

DISASTER IN CULTURAL INHERITANCE PRESERVATION FACILITIES

TOKYO NATIONAL MUSEUM Kanto Earthquake(1923.9.1 Mg.7.9) damaged buildings unrecoverably and 89 exhibited materials.

SENDAI CITY MUSEUM Miyagiken Oki Earthquake(1978.6.1 Mg.7.4) damaged ceiling of exhibition room and air conditioning valve.

AKITA MUSEUM Nihonkai Chubu Earthquake(1983.5.23 Mg.7.7) damaged wall faces of the building and wall painting containing rock slice. Exhibition case was also damaged due to overturn of an exhibition material.

FILM CENTER, TOKYO NATIONAL MODERN ART MUSEUM A fire broke out from the film storage warehouse in the 5th floor of the Center, Kyobashi, Tokyo at 1983.9.3 and continued to burn 5 hours and a half. About 4500 rolls of film were burned including mainly Western Motion Pictures. The cause of the fire was the deactivation of the air conditioning system in view of cost saving.

LOS ANGELES PUBLIC LIBRARY A fire broke out from a stock room, Los Angeles Public Library at 11 pm, 1986.4.29 burning 370 thousand books out of 3.2 million volumes in storage. In addition, other 600 thousand volumes were damaged by violent smoke, while still other 700 thousand volumes were moistened through fire fighting activities.

NATIONAL ARCHIVE OF MEXICO Mexico Earthquake(1985.9.19 Mg.8.1) damaged 12000 buildings in Mexico City. The National Archive of Mexico was suffered slight damage for main building and certain damage for annex storage building which can no longer be used as a storage building. No burning or moistening damages for preserving materials. However, National Archive of Mexico is the organization for administrating 9 subordinate archives and these

archives fell or were fired and moistened. Much labor force is spent to temporarily store the materials transferred from these subordinate archives and repairing them.

PROTECTION OF CULTURAL INHERITANCE FROM DISASTERS

FUNDAMENTAL CONCEPT Flow chart of fundamental concept is shown in Fig.1. Concept consists of 5 stages.

1. Disaster potential and vulnerability
2. Objective disaster and classification of cultural inheritance
3. Priority level of cultural inheritance to be protected
4. Study of practical countermeasures
5. Application of these countermeasures

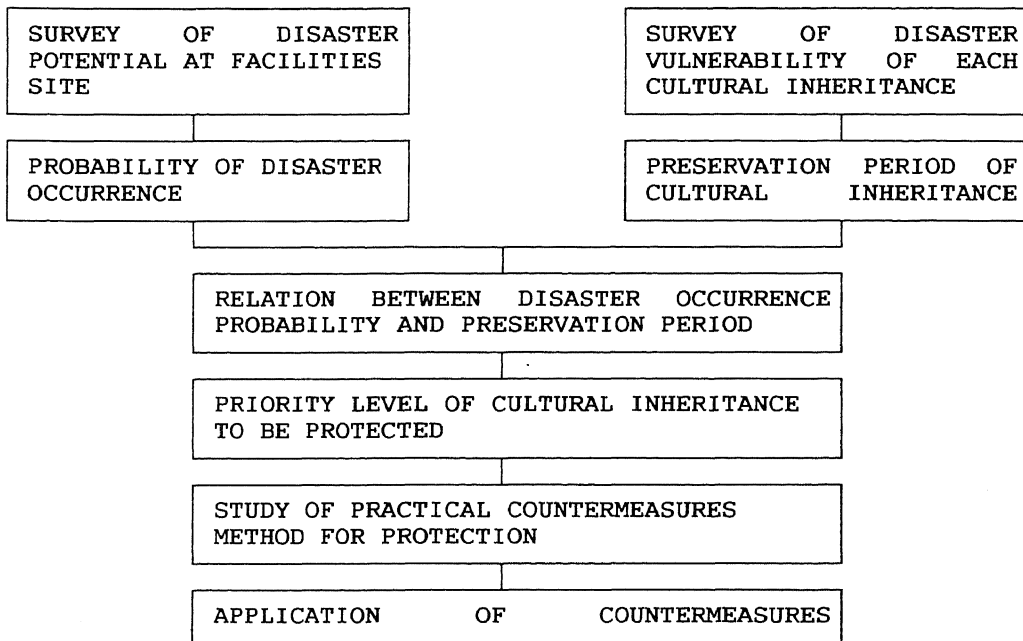


Fig.1 Concept of Protection of Cultural Inheritance

DISASTER POTENTIAL AND VULLNERABILITY

DISASTER POTENTIAL Selection of facilities site is most fundamental subject for protecting cultural inheritance from urban disaster. Unless facilities break out the disaster such as fires, the possibility of disaster occurrence is determined by the characteristics of land where the facility is constructed. In other words, selection of facility site is the most important matter for preventing disaster. Some relation of disaster phenomena and topography may be pointed. Seashore Area for Storm Surge and Tunami, Low level Land for River Spill, Grevass and

Drainage Flood. Area of Fohn Phenomena for Fohn Phenomena, Conjested Built-Up City Area for Earthquake Fire, Soft Ground for Seismic Collapse and Liquifaction Damage. Area of Hinterland for Cliff Collapse of Slope.

Where a facility can not avoid potential disaster coming from the characteristic of site, cultural inheritance should be individually protected from each potential disaster. These are a study on seismic characteristics of ground and building, study on seismic characteristics of each cultural inheritance for earthquake motion. These are study on surrounding conditions of the facilities for fire spread, study on the past records of flooding and inundation for flooding.

VULNERABILITY OF CULTURAL INHERITANCE To study the vulnerability of individual inheritance is important for protecting from disaster in advance. In fact, protection from disasters will be materialized by investigating each material for its own disaster vulnerability and applying the most suitable protective means.

Cultural inheritance is classified into 10 raw materials together with practical examples and preservation facilities, as shown in Table 2. In Table 2 vulnerability for Fire, Earthquake, Flooding are listed.

Table 2 Classification of Raw Materials and Vulnerability

RAW MATERIAL		FACILITIES	FIRE	EARTH-QUAKE	FLOOD
PAPER	BOOK, PICTURE, DOCUMENT	M L A	×	○	×
WOOD	BOOK, SCULPTURE, HOUSE	M L A	×	△	△
STONE	SCULPTURE, ARCHITECTURE	M	○	×	○
METAL	SCULPTURE, SWORD	M	△	×	△
SOIL	CERAMICS, SCULPTURE	M	○	×	○
CLOTH	BOOK, PICTURE, ART	M L A	×	○	×
GLASS	INDUSTIRAL ART	M	×	×	○
FILM	MOVIE, DOCUMENT	L A	×	△	×
TAPE	DOCUMENT, RECORD	L A	×	△	×
LIFE	ANTIQUITY	M	×	△	×

M :Museum, L :Library, A :Archve
 × :Vulnarable △ :Midium ○ :Non vulnarable

PRACTICAL COUNTERMEASURES

Countermeasures for disaster protection should include preventive and post-disaster means.

PREVENTIVE COUNTERMEASURES

(1) Selection of Floor Use, Fixing of Inheritance, Introduction of Floor or Base Isolation System for Earthquake are to be considered. Seismic characteristics of building is to be taken account to exhibit valuable materials. Recently base isolation equipments are developed.

(2) Selection of Floor Use, Introduction of Elevated Floor are important to prevent flood damages.

(3) Back Up System for Cultural Inheritance should be considered. Uniqueness is one of the features with cultural inheritance. The system should be introduced to back up inheritance data, for examples several books are submitted to the National Diet Library while one of them is being preserved in separate location.

POST-DISASTER MEANS

(1) Emergency Countermeasures and Plans should be considered. For example, rapid freezing for moistened documents would be an effective emergency means, no library or archives in Japan yet prepares now.

(2) Cooperation Systems Between Similar Facilities as described in the example of National Archive of Mexico should be established in Japan to recover their function after disaster. Especially National Diet Library and National Archives of Japan have the responsibility to organize such cooperation system with municipal or private libraries and archives.

CONCLUSION

The cultural inheritance should be protected completely from urban disasters in order to transfer the Japanese culture to hand down to posterity. In order that the cultural inheritance is daily used and preserved permanently, these materials should be protected perfectly from urban disasters, although occurring very seldom, as well as from daily damages.

Present state of the art of disaster protection of cultural inheritance is quite behind. Fundamental concept of disaster prevention should be established and be applied to the cultural inheritance preserving facilities. The concept of protection of cultural inheritance from urban disasters conclude as Fig.1.

To make the progress of this problem, Inter-communication between cultural inheritance establishment professionals and disaster prevention experts should be recognized as most important matter.